Appl. No. 10/538,768
Amdt. dated August 10, 2006
Reply to Office action of May 2, 2006
Atty. Docket No. AP1012USN

REMARKS/ARGUMENTS

Claims 1 to 27 are pending in the application. The foregoing amendments to claims 1 and 14 to 16 simply address a lack of proper antecedents resulting from the change from "instrument" to "apparatus" in the Preliminary Amendment. No subject matter has been added by these amendments.

In the Office Action, claims 1-27 were rejected under 35 U.S.C. § 112, and claims 1, 2, 5, 8, 9, 11-15, 18, 21, 22 and 24 to 27 were rejected under 35 U.S.C. 102(b). The rejections are respectfully traversed on the grounds that the examiner has misinterpreted the rejected claims, misunderstood the cited reference by Lee *et al.*, and not appreciated that passive optical networks in which the ONT does not transmit its optical signals unless it is in receipt of optical signals from the OLT are well known to those skilled in this art.

Thus, in paragraph 3 of the Office Action, claims 1 to 27 were rejected under 35 U.S.C. § 112, first paragraph as containing subject matter which had not been "described in the specification in such a way as to enable one skilled in the art to .... make and/or use the invention". More particularly, it was stated that, with regard to claims 1 and 14, the specification did not describe how the ONT 14/9 is operative to transmit a first optical signal (S1) only if it continues to receive a second optical signal (S2) from the other elements (*sic*). In paragraph 5, claims 1 to 27 were rejected under 35 U.S.C. § 112, second paragraph, as indefinite for failing to specify how the element (ONT) is operable to transmit signal S1 only if it continues to receive signal S2 from the OLT.

With all due respect, the examiner's understanding of the knowledge of a person skilled in this art is flawed. Passive optical networks in which the ONT does not transmit to an OLT unless it is receiving signals from the OLT have been known for at least five years, as can be seen from the appended article entitled "Passive Optical Networks" by David Greenfield published on the Internet on 12/05/2001 at URL: http://wwww.itarchitect.com/shared/article/showArticle.jhtml?articleid=17601093.

In the paragraph captioned PON WORKINGS, Mr. Greenfield states as follows:

> When an ONT needs to send information, *it waits for the OLT to send a PLOAM cell*. Each PLOAM cell has 26 or 27 grants that anyone can read. The ONT checks the data grant number in the PLOAM

> cell, and when it matches its own, the ONT uses the grants to send the data. The cell is then transmitted upstream. The OLT receiver receives the bits and, using the preamble to recover the clock, reads out the cells and passes them to the ATM switch for delivery onto the provider's metro core network. (Emphasis added)

Thus, if the ONT does not receive a PLOAN cell from an OLT, it will not transmit its own signal. This feature of passive optical networks is known to those skilled in this art, so the internal operations of the ONT need not be described in order for the description to be enabling.

Indeed, the problem addressed by the present invention is the need to maintain the signals received by the ONT while monitoring the signals passing simultaneously in opposite directions in the link. The problem was acknowledged quite recently in an article entitled "Fundamentals of a Passive Optical Network (PON) by David Cleary, Ph.D., then Vice President, Advanced Technology of Optical Solutions, Inc.; clearly a person skilled in this art. In the second paragraph of the section captioned "Field Test Equipment for the PON" on page 8 of the document, Dr. Cleary states as follows:

> It should be noted that only the downstream light can be measured. This is because an ONT will not transmit unless it is in constant communication with an OLT.

Thus, Dr. Cleary was well aware of passive optical networks in which the ONT would not transmit unless it was in constant communication with an OLT. Accordingly, it is submitted that there is no need to describe in detail how the ONT actually operates and that the description certainly would enable a person skilled in this art to make and/or use the invention. It follows that neither independent claims 1 and 14 nor the claims dependent upon either of them, are indefinite.

It is worth noting that Dr. Cleary's remark also indicates that, as recently as late 2005, he was under the impression that, as a result of this feature of the ONT, one could only measure light propagating downstream. Embodiments of the present invention advantageously allow light propagating in both directions to be measured.

In paragraph 7 of the office action, claims 1, 2, 5, 8, 11, 13-15, 18, 21, 24, 26 and 27 were rejected under 35 U.S.C. 102(b) as anticipated by the disclosure of Lee *et al.*'s US patent

No. 6,188,509. This rejection is respectfully traversed on the grounds that US6,188,509 does not disclose every physical or functional feature of each of those claims.

As amended above, claim 1 reads as follows:

> 1. Portable apparatus for measuring parameters of optical signals propagating concurrently in opposite directions in an optical transmission path (16, 16/1,..., 16/9) between two elements (10, 14/1...14/9), at least one (14/1...14/9) of the elements being operative to transmit a first optical signal (S1) only if it continues to receive a second optical signal (S2) from the other (10) of said elements, the apparatus comprising first and second connector means (22, 24) for connecting the apparatus into the optical transmission path in series therewith, and means (32, 38, 46) connected between the first and second connector means for propagating at least said second optical signal (S2) towards said at least one (14) of the elements, and measuring said parameters of said concurrently propagating optical signals (S1, S2).

The first and second connector means connect the apparatus "into the optical transmission path ***in series*** therewith,..." (Emphasis added) For the apparatus to be in series with the path, it follows that there are two connections to the optical transmission path and that each of the counter-propagating signals passes into the apparatus through one connector, out of the apparatus at the other connector, and continues along the transmission path. Moreover, it follows that the bidirectionally-propagating signals are measured at that insertion point in the transmission path. Lee *et al.* do not disclose portable apparatus connected *in series* with the transmission path in this way.

With all due respect, the statement that "Lee teaches a portable apparatus (300, 340, Fig. 2) for measuring parameters of optical signals (col. 4, lines 30-35, 65-66)..." misquotes Lee *et al.* The statement at col. 4, lines 30-35 actually reads "In order to test performance of the bidirectional WDM add/drop amplifier module according to this invention...."

Thus, Lee *et al.*'s disclosure primarily relates to an Add/Drop amplifier module. Lee *et al.* describe how the amplifier module can be connected into a bidirectional system and its performance measured by means of an optical receiver 300 having a power meter 340. In Lee *et al.*'s Figure 2, the amplifier module 100 is shown connected to sources SL1, SL2, SL3 at the

left hand side of Figure 2 by way of a 40 km fiber, left-hand splitter (no number), left-hand modulator 220L and left-hand multiplexer 210L; and to a set of sources SR1, SR2, SR3 at the right hand side of Figure 2 by way of a 20 km fiber, right-hand splitter (no number), right-hand demodulator 220R and right-hand demultiplexer 210R. Each of the two splitters allows a portion of the signal propagating along the transmission path to be tapped out and supplied to the optical amplifier 100.

To measure the effect of the amplifier module 100 upon the signals SL1, SL2, SL3 propagating from left to right, the optical receiver 300 is connected to the right-hand splitter downstream of the amplifier module 100. Bandpass filter 310 demultiplexes the tapped portions of the signals SL1, SL2, SL3 before applying them to the power meter 340 by way of attenuator 320 and 90:10 coupler 330.

Conversely, to measure the effect of the amplifier module 100 upon the signals SR1, SR2, SR3 propagating from right to left in Figure 2, the optical receiver 300 is connected instead to the left-hand splitter (as shown by the broken line) and so receives tapped portions of signals SR1, SR2, SR3 downstream of the amplifier module 100.

It is apparent, therefore, that Lee *et al.* do not disclose apparatus having first and second connectors for connecting the apparatus in series with an optical transmission path, i.e., so that each of the signals passes from the path, into the apparatus through one connector, out of the apparatus through the other connector, and continue along the path.

Accordingly, Lee *et al.*'s US patent No. 6,188,509 does not disclose every feature of claim 1. Independent method claim 14 is similar to claim 1 and so is not anticipated by Lee *et al.*'s disclosure for similar reasons.

Since all other claims are dependent upon one or other of claims 1 and 14, it follows that they are not anticipated by Lee *et al.*'s disclosure for the same reasons.

In paragraph 9, claims 12 and 25 were rejected under 35 U.S.C. § 103(a) as unpatentable over US6,188,509 (Lee *et al.*) in view of US6,600,594 (Ko *et al.*). Lee *et al.* do not disclose the features of claim 1, so it is immaterial whether or not Ko *et al.* disclose a microcomputer for use in measuring optical signals; the skilled addressee would not arrive at the invention of claims

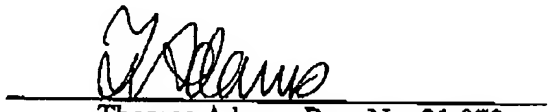
12 and 25 by combining Lee *et al.* with Ko *et al.*

The rejection of claims 9 and 22 under 35 U.S.C. § 103(a) as unpatentable over US6,188,509 (Lee *et al.*) in view of US5,535,038 (Hinch) also is without merit. Since US6,188,509 does not disclose all of the features of claims 1 and 14, it is immaterial whether Hinch discloses means for measuring averaged optical power; the skilled addressee would not arrive at the invention of claims 9 and 22 by combining these references.

In paragraph 11, it was stated that claims 3, 4, 6, 7, 10, 16, 17, 19, 20 and 23 would be allowable if rewritten to overcome the objection under 35 U.S.C.§ 112. These claims have not been rewritten, however, because it is deemed unnecessary.

In view of the foregoing, it is submitted that all claims of record are patentable over the cited references and early and favourable reconsideration of the application is respectfully requested.

Respectfully submitted,



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